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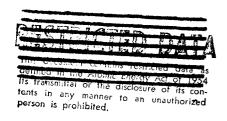
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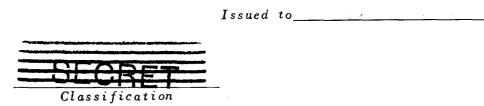
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LIVERMORE LABORATORY	PLANS IN CASE OF A TES	T MORATORIUM	· ·		
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UNIVERSITY OF CALIFORNIA Radiation Laboratory

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RADIATION LABORATORY P. O. BOX 808 LIVERMORE, CALIFORNIA

Cite: BY-58-150
Cotober 16, 1958

Mr. John A. McCone, Chairman U. S. Atomic Energy Commission Washington 25, D. C.

My dear Mr. McCone:

The following is an outline of the Livermore Laboratory plans in case of a test moratorium.

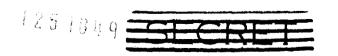
Two Laboratory activities have been scheduled for an increase whether or not there is a test moratorium. These are the Pluto project and pure research.

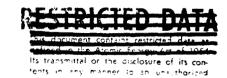
Project Pluto has been held back during the last few months due to the extreme pressure of the Hardtack series. In order to meet our schedule on Pluto we will have to raise the percentage Laboratory effort from approximately 9.5 percent currently to 12 percent after November 1st (11 percent was proposed in program letter).

A similar situation holds in the case of pure research which has been hit hard by our accelerated testing program. Furthermore in the past years the Livermore Laboratory was expanding steadily and during this period of expansion we were working under constant pressure to accomplish important and immediate goals. We expect that the Laboratory shall be on a more steady level starting FY 1960. It is proper during this coming period to pay more attention to pure research since the long-range health and the reputation of the Laboratory depend to a considerable extent on this particular effort. It is therefore planned to increase pure research from 10.5 percent to 14 percent of the Laboratory effort.

A further activity in the Laboratory which is not connected with nuclear testing in any way is the Sherwood program. It is now rather generally recognized that no immediate and dramatic developments are likely to occur in this field. At the same time it is also felt that a very valuable facility has been established in the Laboratory which is directed toward the broad and important field of plasma research. It is planned to keep that effort on an even keel and to continue to devote 12 percent of the Laboratory effort to it.

According to our plans the main effort of the Laboratory will continue to be directed toward the development of nuclear explosives. A moratorium on testing does not decrease the importance of work on nuclear weapons, but requires





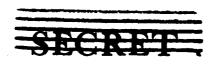
a different, perhaps more exacting and certainly more diversified approach to their design. In this spirit we plan to design new experimental devices for weapons development and to prepare them for possible tests in case the moratorium should be terminated or modified. We furthermore hope to be able to make some advances which are essential and which at the same time are so cautiously planned that in case of continued moratorium the corresponding weapons can be put into stockpile without testing. The effort of designing weapons in preparing for weapons tests is expected to absorb 34 percent of the Laboratory effort.

The way in which the next mentioned activities can be carried out will depend to a considerable extent on the precise terms of the moratorium. If we assume that only such tests will be banned which actually can be policed, then a considerable amount of testing can accompany the further development of weapons. We would plan to carry out these tests underground and we would hope that the tests can proceed on a continuous and well-considered basis, avoiding in the future the hectic and uneconomical procedure of bunching our experiments into test series.

If tests should be permitted at high altitudes the Laboratory would continue to have a great interest in this particular field. Even in case that the moratorium should prohibit such high altitude shots the Laboratory would continue to investigate this question theoretically and also to explore phenomena which are similar to nuclear explosions but which do not actually involve nuclear explosions. As an example, we should mention the possibility of dispersing and following radioactive substances at very high altitudes.

In connection with weapons effects it will be of continuing importance to find out to what extent underground shocks can be detected and to what extent underground shocks can be decoupled from the detectable earthquake waves of long wavelength. The most reliable method of such exploration would use small nuclear explosives. In case the test moratorium does not permit these, we propose to carry out less conclusive experiments with the help of high explosives. The two topics mentioned above, i.e., the investigations of shots at high altitudes and the study of effects of underground shots will be part of a continued effort of the testing group.

In case all nuclear tests are to be prohibited it will be of continuing importance to perform shots which can be properly called nuclear experiments rather than tests. These shots serve two purposes. The first is one-point shots which explore the safety of our weapons. The second is a group of experiments in which nuclear material will react to a detectable measure but in such a way as not to give enough yield which in itself would classify the experimental object as a weapon. How we should proceed with such one-point shots and nuclear experiments will depend to a very great extent on the precise way in which such permitted experiments are defined. One possible procedure would be to set a more or less arbitrary limit, for instance, a yield of ten tons below which it is recognized that the objects do not qualify as tests. If we are asked to adhere to some yield limitation in a rigorous manner we can certainly accomplish that by approaching any such experiment in a stepwise fashion. While this will involve



us in more labor and in more expense it also will give us more thorough knowledge and may therefore pay in the long run. Whether or not such additional experiments are permitted in a reasonably generous fashion the Laboratory is planning to continue on weapons development as mentioned above. The effectiveness of this development will depend, however, to a considerable extent on the rules which are to be established. Keeping our test organization in a position to resume testing as dictated by an agreement or lack of it, and catching up on the analysis of past tests, will consume about 6 percent of the Laboratory effort, down from a planned level of 14 percent and a current level of 16 percent.

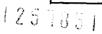
The Laboratory has recently started on a program of weaponizing devices which we have already tested. Since there are now several satisfactory designs which should be weaponized we are planning to increase our percentage effort to a figure of 15 percent. This work will be carried out jointly with the Livermore branch of the Sandia Laboratory.

Lastly, we expect to increase greatly our efforts in the non-military uses of nuclear explosives. This topic has been covered in detail in our Plowshare program letter. We expect that the Plowshare program will account for 4 percent of the Laboratory's effort in the next period.

In addition, the Laboratory is engaged in a general survey of other possible fields in which we might be interested. We have no firm plans at the present time but we might make some suggestions in the not too distant future. In making these we shall be guided by the consideration that the facilities and skills already available in the Laboratory may make it possible for us to carry out some important tasks in a particularly expeditious manner. Such a survey can be expected to account for about 3 percent of the Laboratory's activities.

The following table shows the approximate distribution of percentage efforts in the various fields mentioned together with a comparison with the percentage efforts allotted at the beginning of the fiscal year. It will be noted that the total effort which we plan to expend on nuclear explosives is, according to our present (59 percent), less than it was in the previous plan (63 percent), but the difference is not very significant.

	Planned FY 59	August Rate	Proposed for Immediate Future
Weaponization	12	14.5	15
Test Preparation			
and Execution	13.8	16.0	6
Weapon and Device			
development	34	35.6	34
Plowshare	3.2	1.4	4
Sherwood	12.6	12.5	12
Pluto	11.1	9.5	12
Pure Research	13.3	10.5	14
Miscellaneous and			
Additional Activiti	es		3







Mr. McCone

-4-

October 16, 1958

A more detailed and definitive plan is under consideration.

Sincerely yours,

Edward Teller

ET:gg

Distribution:

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